

AI Cover Sheet

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**Learning Journal: Counting, Comparing, and Discovering Forces and Motion**

**Date:** 10<sup>th</sup> September 2025

**Group:** 6 children, age 3-4

**Setting:** The Forest school learning area

**Curriculum links:** Curriculum for Wales / Curriculum for non-maintained settings

## **The forest school environment**

(HighCross, 2025)



## **Introduction**

Today, the children explored the outdoor log circle. The children noticed the logs straight away and wanted to sit down on them. The grass within the log circle was wet and slightly muddy from the rain that had fallen in the morning. The grass immediately caught the children's attention, and they soon began stomping and jumping around to see how muddy they could get. The space felt natural and open, perfect for them to explore the natural environment. One child noticed a stick on the floor and started to pick at the mud using it to dig up the squishy soil. Another child decided to use their hands to pick up the soil by rolling it in their hands to form a ball shape. To which he shouted to another child, "Look at a ball!"

We let them explore their surroundings, which enabled them to play freely. We asked them open questions: How many children can fit in this log? Why do you think the soil is easier here than over there? This led to a powerful sensory experience.

**To enhance the learning experience, we brought along resources to help extend their learning.**

- **Saucepans, mixing spoons, for creative experiments**
- **Small pots, scoops for mud mixing or sorting activities**
- **Scrap paper and cardboard/ used paint brushes for mud paintings**

## **Natural Resources**

During the woodland activity, the children began to collect natural materials from around the forest school environment, for instance, sticks, leaves, and pinecones. This created a collecting and comparing activity in which some children compared the sticks from small to large, and then they discussed the look and feel of the sticks. One child said, "This stick is very bumpy and pointy." Another stated that the colours of the sticks were different, which led to the use of comparative language confidently ("longer," "shorter," "smaller," "bigger"). Some children showed an early awareness of relationships by forming pairs with sticks and leaves they had collected. **This links to progression step "I am learning to play with quantities and numbers"**, Curriculum for Funded Non-Maintained Settings (CfNMS) (Welsh Government, 2022) (hereafter WG).



One child decided to fill the pot up with soil and used the mixing spoons we provided to stir the mud; he then proceeded to add some water from a puddle that had formed. asking questions like "Why do you think the mud has gone runny now"? What do you think will happen if you add more mud or water? Another two children decided to join, bringing saucepans and stirring spoons. One child said, 'Can we help you make some dinner?' while another child said, 'I will make some lovely soup for us all to eat.' This caused all 6 children to congregate, all adding their individual touch to the investigation. One child decided to make bread and mix leaves and sticks in with the mud. She patted the mud and manipulated it with her hands to form a shape, which she represented as a loaf of bread.

During the session, we used reflective language with the children, asking questions. For example, "I wonder what would happen if I added more mud to the soup? Would it still look like soup? "How did you decide which stick was the shortest or longest?"

Throughout the session, the children engaged in different investigations. 2 children decided to use the pinecones and stones they had collected and to roll them down the small hill. They observed that certain objects rolled more quickly. **Indicating early observation of differences in shapes** (CfNMS) (WG,2022).

(Google Images, 2025)



### Logs



The logs became a central focus of the outdoor learning environment. The layout and design of the provision encouraged the children to climb, balance, walk, and jump. In doing this, the children are experimenting with forces. **I can communicate the effect forces have on myself and on objects** (CfW) (WG, 2022). We extended this by asking, “What helps you stay steady on the log?” One child noticed that by using their arms outstretched like wings, they can be more stable on the log. “Can you balance with your eyes closed?” Another child indicated that they found it much harder to balance with their eyes shut and needed to be able to see to help maintain their balance.

(Google images, 2025)



### Grass

The grass within the forest school area is more than just a backdrop. It provides opportunities for children to investigate the surfaces around them. During our session, we observed that one child touched the grass with their hands, noticing that the grass was damp, while another child was quick to point out that if we ran on the grass, we could slip. These observations link to the concept of friction and how different surfaces impact movement. We asked questions, “Why do you think it’s easier to land on the grass than on the hard path?” “What changes when the grass is wet?” This is in line with (CfW) (WG, 2022). **I can use my knowledge and understanding to predict effects as part of my scientific exploration.**

### **Mathematical Concepts**

- **Comparisons:** small, big, wet and dry. How much water is needed to make mud runny?
- **Counting:** counting the sticks and ordering them in size order. Forming pairs with sticks and pinecones
- **Volume:** Full/empty, more and less using cups and scoops, adding mud to the saucepans, determining if they needed more soil or water for a runny mixture or a thicker mixture.
- **Colours and Shapes:** The children noticed the different colours and shapes of the leaves and pinecones.

### **Scientific Concepts**

- **Forces and Motion** – children rolled pinecones and stones down a hill, recognising that some moved faster than others
- **Properties of Materials** - As they investigated texture and flexibility, one child noticed that some sticks snapped while others bent. They said, "This one broke!" and "This one is bendy." They observed the difference in texture when adding more water to the soil and the difference in the feel of the soil in their hands when adding more soil and less water.
- **Seasonal Changes** – One child noticed that the leaves were on the ground, and some had changed colour. "It is cold", she said, "so the tree has dropped the leaves".
- **Balancing and stability** – children balanced on logs, noticing relationships with their body positioning, gravity, and balance.

### **Holistic Development Concepts**

- **Physical:** Children strengthen their core muscles, coordination, and balance
- **Emotional:** Overcoming their fears of jumping off the logs and building self-confidence and self-belief.
- **Creativity:** Pretend play when the children made soup with the mud and water, exploring the resources within nature.

**The questions we used to encourage deeper exploration and deeper thinking skills:**

To scaffold critical thinking, problem-solving, and mathematical exploration. We used open-ended questions as this type of questioning helps maintain the learning environment to be child-led while also allowing practitioners to observe and assess the children's understanding and support the main areas of learning and experience.

**Reflection**

During this session, the children gained a greater understanding of the scientific side of their play. By observing the children, we noticed that they were not just making a mess with the mud and water; they were also experimenting with materials and learning about their properties. **One of the progression steps for the Curriculum for Wales (CFW) WG, (2022) and technology states that children show curiosity and question how things work. This was evident throughout this session.**

The logs within the learning environment proved to be both engaging and stimulating for the children, while also supporting the five developmental pathways (belonging, communication, exploration, physical well-being, and creativity). Additionally, they provided engaging opportunities across Science and Technology, Mathematics, and Numeracy.

- To make further improvements for the next session, we could set up planks between the logs to increase complexity and balance.
- Repeat the above activities that the children engaged in again, but in different weather conditions (frosty grass, frosty logs)
- Introducing life cycles links, such as observing insects around the logs
- Get the children to build dens to create shelter during the summer and winter months
- Bring magnifying glasses for the children to explore minibeasts or to see the different formations with the wood bark.
- As our current theme for the term is George's Marvellous Medicine, get the children to extend on the mud making and add extra elements for them to make potions.

**Part 3 Risk Assessment**

|                             |                           |                     |         |
|-----------------------------|---------------------------|---------------------|---------|
| <b>Location / Activity:</b> | Forest school (HighCross) | <b>Date:</b>        | 10/9/25 |
| <b>Assessor:</b>            | Helen Wright              | <b>Review date:</b> | 10/3/26 |

The boxes in the table below will expand as you type into them; pre-entered text is simply for illustration. You should delete irrelevant items and replace with text relevant to your circumstances. Your overall risk rating – Low, medium or high – is based on your judgement about whether the BENEFITS of the activity or opportunity outweigh the RISKS.

| <b>Experience exploring outdoor space in photograph</b> | <b>How will young people BENEFIT from this activity?</b>                                                                | <b>Hazards and associated risks</b>                                                      | <b>Who is at risk?</b> | <b>PRECAUTIONS in place to reduce the risk of injury</b>                                                                                                                                                    | <b>Overall risk after precautions<br/>RATING:<br/>L/M/H</b> |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Walking on uneven surfaces                              | Supporting the children's core skills (balance)<br>Children becoming aware of their fears and what their bodies can do. | Children may fall over, causing cuts, bruising, or other injuries. Possible trip hazards | Children and adults    | Discuss with the children before entering the outdoor provision to be mindful of the uneven ground. Also, please note that due to the bad weather, the ground may be slippery, so they need to be cautious. | L                                                           |

|                                      |                                                                |                                                                                                  |          |                                                                                                                                                                                                                                                                                                                                                                    |   |
|--------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Children jumping on and off the logs | Physical development: stretching, bending, jumping, balancing. | Falling off the logs or onto another log.<br>Possible head injury. Cuts or bruising to legs/arms | Children | <p>Discuss with the children beforehand that it is ok to explore the logs and to jump onto them, as well as jumping from one log to another, but they need to be mindful of how slippery the logs have become due to the weather conditions.</p> <p>Children are to wear appropriate footwear during this session.</p> <p>(First aid kit with us at all times)</p> | L |
| Children exploring the environment,  | Children are allowed to explore the natural                    | Low-level branches, along with children pointing sticks in other children's                      | Children | Discuss with the children the golden rule: nothing in their                                                                                                                                                                                                                                                                                                        | L |

|                                              |                                                                                                                                       |                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| such as<br>stones,<br>sticks, and<br>conkers | environment,<br>counting,<br>comparing,<br>ordering,<br>Physical<br>development, fine<br>motor skills,<br>bending, and<br>stretching. | faces, cause possible eye<br>injury.<br><br>Picking up inappropriate<br>materials, such as rubbish.<br><br>Touching the wild<br>mushrooms that we have<br>growing in the outdoor<br>provision.<br><br>Allergies to grass and<br>insect bites.<br><br>Aware of irritant plants like<br>stinging nettles.<br><br>Splinters |  | mouths and wash their<br>hands after the<br>session.<br><br>Children are shown<br>pictures of the wild<br>mushrooms and<br>stinging nettles (this is<br>shown in every forest<br>school lesson), so<br>children are aware of<br>the hazards and know<br>not to touch the<br>mushrooms.<br><br>Children are to wear<br>long-sleeved outdoor<br>suits and appropriate<br>footwear during forest<br>school sessions |  |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

| Experience exploring outdoor space in photograph    | How will young people BENEFIT from this activity? | Hazards and associated risks | Who is at risk? | PRECAUTIONS in place to reduce the risk of injury   | Overall risk after precautions<br>RATING:<br>L/M/H |
|-----------------------------------------------------|---------------------------------------------------|------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------|
|                                                     |                                                   |                              |                 |                                                     |                                                    |
| Toilet accident during the outdoor learning session | N/A                                               | Wet clothes                  | Child           | Take some spare clothes during the outdoor session. | L                                                  |

| Experience exploring outdoor space in photograph | How will young people BENEFIT from this activity?             | Hazards and associated risks       | Who is at risk? | PRECAUTIONS in place to reduce the risk of injury                                                                                                                                                                          | Overall risk after precautions<br>RATING:<br>L/M/H |
|--------------------------------------------------|---------------------------------------------------------------|------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Children falling off a tree/branch               | Using balancing techniques, gaining confidence in exploration | Possible head injury/ graze or cut | Child           | <p>Observe the outdoor provision before the lesson commences, making sure that the trees are in good condition.</p> <p>Tell children to be mindful of the branches and the strength of the branches when climbing them</p> | L                                                  |

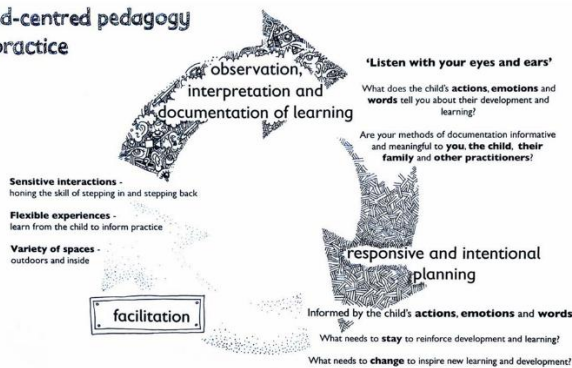
| Experience exploring outdoor space in photograph | How will young people BENEFIT from this activity? | Hazards and associated risks                   | Who is at risk? | PRECAUTIONS in place to reduce the risk of injury                                                                                                                                                                                                                                                                                    | Overall risk after precautions<br>RATING:<br>L/M/H |
|--------------------------------------------------|---------------------------------------------------|------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Children getting sunburnt                        | N/A                                               | Possible exposure to the skin, causing redness | Child           | <p>Practitioners need to make sure that all children are wearing hats and that sunscreen has been applied during the summer months, when in the forest school environment.</p> <p>During extreme weather conditions, the use of a temporary shelter would be made for the children to come away from the sun and into the shade.</p> | L                                                  |

| Experience exploring outdoor space in photograph | How will young people BENEFIT from this activity? | Hazards and associated risks  | Who is at risk? | PRECAUTIONS in place to reduce the risk of injury                                                                                   | Overall risk after precautions<br>RATING:<br>L/M/H |
|--------------------------------------------------|---------------------------------------------------|-------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Possible asthma attack                           | N/A                                               | Possible need for asthma pump | Child           | To make sure that all children who are recorded as being asthmatic (the teacher will carry their pumps in a separate bag if needed) | M                                                  |

Let's look again at our 'child-centred pedagogy in practice' cycle:

Observations and following the interests of the child

### child-centred pedagogy in practice



## Part 4

**With reference to theory and research, evaluate how adults working with early years children support and encourage children engage with mathematical and scientific concepts in an outdoor environment**

## Introduction

The outdoor environment provides rich, open-ended opportunities for children to explore their curiosity. The importance of an outdoor learning environment within an early childcare provision has a lasting influence on cognitive development as well as STEAM learning opportunities (Trina *et al.*, 2025).

One theorist who recognised how important outdoor learning is was Froebel. He could see that children are active, curious, and creative learners. He believed that children engage best through first-hand experiences, problem-solving, play, and talk. He also believed that children would thrive in environments where they feel safe, secure, and in close relationships with their peers. Froebelian educators emphasize the importance of observing, supporting, and extending (through planning additional resources) to help aid progression. By having realistic high expectations of the child, this can be from knowing the child enough to know when they need space or when to support sensitively. The outdoor environment offers many opportunities for symbolic thinking (Tovey, 2016).

However, it must be noted that adults play a vital role in encouraging children to deepen their understanding by asking them open questions, which supports Bruner's (1978) discovery learning theory, in which he states that children learn best when encouraged to investigate and construct for themselves.

Shannon, (2025) states that the importance of open-ended questions in early years provides children with the opportunity to fail, hypothesize, experiment, and succeed on their own. Open-ended questions encourage independent thinking as well as guide children to discover and investigate further. By providing this type of questioning, it enables the child to take the lead and to guide the conversation. It provides valuable information to the practitioners on what is important to them and how they process things in different ways by encouraging creative thinking and aiding the child to use their imagination.

Piaget states that "play is work for children", and learning through play and exploration is created and nurtured when adults participate in the process. The adult's role is to facilitate, scaffold, and teach. Vygotsky's sociocultural theory encourages us to recognise and respond to the zone of proximal development. This is the range between what a child can accomplish independently and what they can do with guidance and support from adults. Vygotsky, (1978) states that adults help children facilitate their exploration by guiding them through exploration and posing open-ended questions to encourage developmental progress with cognitive skills.

Supporting sustained shared thinking comes from playing with the child and working with them to think more deeply and learn more. Sustained shared thinking is an effective method for improving children's cognitive abilities. Arnerich (2025) states that children benefit from these meaningful encounters, providing children with the ability to solve problems, improve their critical thinking skills, and increase recall and memory. According to Jean Piaget's (1964), a theorist associated with constructivist theory, learning occurs when children actively explore and engage with their surroundings, and adults support this process by offering resources to help aid in exploration and to enhance their knowledge and encourage reflection (Bemporad, 1975). Piaget believes that children's play is important to their learning and development. Piaget's research on

how children develop understanding via experience served as a foundation for Chris Athey's schema theory. Athey defines a schema as "a pattern of repeatable behaviour into which experiences are assimilated and that are gradually coordinated. Coordination leads to higher-levels and more powerful schemas." (Birth to 5 matters, 2021). A schema works when a child has a primary area of interest in which they are engaged at any given time. To gain an understanding of how the world works, they will repeat an action until they understand it in different contexts. Understanding Athey's schemas transforms how you can support a child's natural learning pattern. Ralphs, (2025) points out that practitioners will have a clear understanding of when to step back rather than interrupt, which can help by enabling adults to provide more meaningful resources to extend the schema, instead of just random toys that will not enable the child to progress. When practitioners understand the importance of schema exploration, they will observe that moments of seemingly repetitive play will become opportunities rather than frustrations.

Louis, (2023) states that it is essential to include opportunities for mathematical experiences and discussions. She believes that children show awareness of and are responsive to numbers and counting. Numbers are part of everyday life. Equally, children are sorting and making comparisons as well as problem-solving all the time. Using natural materials for counting, sorting, measuring, and patterning (e.g., sticks, stones, leaves), encouraging comparison "which rock is heavier "," How many sticks do we need to measure your foot". Adults play a key role in providing motivational learning and appropriate challenges. Dancer, (2023) also states that it is important that practitioners embrace the unique qualities that the outdoors provides. Plan opportunities that give children time and space to explore mathematical concepts. Adults have a rich source of knowledge and experience of the world around them, which enables them to support children to make progress in their learning journey. This is what Bruner meant by "scaffolding. Bruner *et al.* (1976). This is when practitioners assess the needs of the children by observation and adjust their level of support accordingly. Scaffolding allows children to develop at a gradual pace by slowly reducing external guidance as they become more proficient.

Practitioners also need to ensure that science is embedded from an early age. The outdoor environment naturally provokes questions rooted in curiosity and inquiry. “What happens when it rains?” “Why do the leaves change colour?” This encourages children to observe, predict, experiment, and reflect upon their experiences. In Australia, STEAM learning within the early years is based on the Conceptual Play world model, led by Laureate Professor Marilyn Fleer. Who states that imaginative play is a vehicle for scientific learning? Children and adults work together to co-create stories that include scientific ideas. For example, a story about a falling star might be used to explore gravity. This method works especially well outside, where children can interact with nature (Fleer, 2019).

Another concept that enables adults to support children is Gibson’s The Ecological Approach to Visual Perception. Gibson, (1979) concept of affordance is that children view objects. This foundational theory underpins how children view and engage with loose parts: they see objects not for what they are, but for what they can do with them. Such as sticks, stones, and crates, all provide for mathematical exploration.

The concept of affordance, introduced by Gibson (1979), refers to the possibilities for action that an environment offers. Loose parts—such as sticks, stones, crates, and fabric—provide affordances for mathematical exploration. Children can count, sort, measure, and compare these materials, engaging in spatial reasoning and problem-solving. Adults can help with this by selecting resources and promoting inquiry. Play Scotland, (2020) states that loose parts help create a rich environment, enabling children to follow their interests and go where their curiosity takes them.

Louis, (2023) suggests that observation is an important part of supporting children; we observe children to gain knowledge of what they can and cannot do. This enables us to determine where extra support is required. By using observation, practitioners can gain a better understanding of the child. During observations, adults can pick up on a child’s interest, talking, moving, and facial expressions. Social engagement with their peers,

schemas, and emerging learning. Louis (2023) points out that observations are like stories.

To illustrate this point, one might refer to the Reggio Emilia Approach (hereafter REA), where children are seen as strong, competent, and active participants in their own learning journey. This approach helps aid practitioners not to deliver lessons to the children, but to co-investigate along with the children. This helps to encourage adults to slow down and observe the children while also asking open-ended questions to further develop the play. Reggio Emilia believes that the third teacher is the environment and that there is not just an outdoor and indoor space, but it is one complete environment. This approach has been encouraged all around the world, with recent studies in Australia and Scotland wanting to engage in this approach. Guo & Rouse, (2024) point out that there is substantial evidence from qualitative research that the REA approach is working and has influenced teaching pedagogies beyond the REA context. However, there are difficulties in incorporating it into Australian early childhood education, which calls for proactive steps by educators and policymakers. engagement, resource support, professional growth, and a reconsideration of traditional teaching techniques. Education Scotland, ( 2024) also believes that REA will create problems in incorporating it into their curriculum. They point out that REA has evolved gradually over a period of 40 years, along with a difference in both social and cultural settings. However, it cannot be denied that the philosophy that REA adapts and the fact that the rhythm and pace of the child are always given overriding importance. This means really having time for children's thoughts and ideas, and giving value to their work, their conversations, and their feelings by slowing down to listen to them." These are all essential concepts that every provision and practitioner needs to take on board to further support children in a more holistic approach.

### **In Conclusion**

Early childhood education provides a vast opportunity for outdoor learning with a rich array of mathematical and scientific exploration. Adults play a pivotal role not as instructors but as co-learners, facilitators, and observers. Who scaffolds children's

natural curiosity into meaningful experiences. Through approaches such as Reggio Emilia, which believe the environment is a third teacher to the integration of loose parts, open-ended questions, and sustained shared thinking all provide a foundation for skillful interactions and emerging interests. The work of educational theorists (Vygotsky, Piaget, Bruner, Froebel, Emilio, and Bowlby) can be identified as having a considerable influence on the relationships between practitioners and children.

Outdoor experiences have many benefits, not just mathematical and scientific concepts, but also well-being. It encourages growth and independence while also enabling exploration and curiosity. "Children thrive when they are emotionally secure, joyful, and in close relationships with others."

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